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EXAMINER

WON, MICHAEL YOUNG

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/583,677
Filing Date: May 31, 2000
Appellant(s): NOVAES ET AL.

MAILED

APR 25 2005

Technology Center 2100

Blanche E. Schiller (Reg. No. 35,670)
For Appellant

EXAMINER'S ANSWER

1. This is in response to the appeal brief filed January 24, 2005.

Real Party in Interest

2. Appellants' statement identifying the real party in interest is contained in the appeal brief filed January 24, 2005 is correct.

Related Appeals and Interferences

3. Appellants' statement identifying the related appeals and interferences contained in the appeal brief filed January 24, 2005 is presumed to be correct.

Status of Claims

4. Appellants' statement identifying the status of the claims contained in the appeal brief filed January 24, 2005 is correct. Claims 1-3 and 6-76 are pending.

Status of Amendments After Final

5. Appellants' statement of the status of the claims contained in the appeal brief filed January 24, 2005 is correct.

Summary of Claimed Subject Matter

6. Appellants' summary of claimed subject matter contained in the appeal brief filed January 24, 2005 is correct.

Grounds of Rejection to be reviewed on Appeal

7. Appellants' statement of the grounds of rejection to be reviewed on appeal contained in the appeal brief filed January 24, 2005 is correct.

Grounds of Rejection

8. The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

I. Claims 1-3 and 6-75 are rejected under 35 U.S.C. 102(e) as being anticipated by Wipfel et al. (US 6338112 B1).

INDEPENDENT:

As per claims 1, 27, and 51, Wipfel teaches a system of managing clusters of a computing environment (see title), said system comprising: a registry component (see Fig.6, "registry 600") to provide global data storage for global data of a cluster of said computing environment, said cluster including a plurality of nodes of said computing environment (see Fig.1 and col.5, lines 29-31) and said global data comprising configuration data of multiple nodes of the plurality of nodes (see Fig.2, #224; Registry 600; and col.14, lines 1-8); configuration component to maintain data locally on at least one node of said plurality of nodes (see Fig.2, #218 and col.8, lines 11-14), and to store global data in said registry component (see Registry 600, #604; col.14, lines 1-6 & 25-38); liveness component to provide status of one or more communications paths of said cluster (see Fig.3, #326; Registry 600, #618; and col.14, lines 10-14), said liveness component being dependent upon said registry component and said configuration component (see col.14, lines 3-38); a group services component to provide one or more services to one or more other components of said cluster (see col.9, lines 7-9 and col.14, lines 31-36), said group services component being dependent on said registry component, said configuration component and said liveness component (see Registry 600 and col.14, lines 3-38); and a resource management component to provide communications to one or more resource controllers of said cluster (see col.8, line 36 to col.9, line 11), said resource management component being dependent on said registry component, said configuration component and said group services component (see col.9, line 6-15).

DEPENDENT:

As per claims 2, 3, 6, 28-30, and 52-54, Wipfel further teaches wherein said registry component is functionally dependent (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38) on said group services component for at least one type of operation (see col.9, lines 45-48: probing), wherein said at least one type of operation comprises a write operation (see col.9, lines 48-52: "updated").

As per claims 7, 31, and 55, Wipfel further teaches wherein said being dependent comprises being functionally dependent (It is inherent that since Wipfel discusses an operational relationship, all dependencies are functionally dependent: see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 8, 32, and 56, Wipfel further teaches wherein said registry component lacks a data dependency on said configuration component, said liveness component, said group services component and said resource management component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 9, 33, and 57, Wipfel further teaches wherein said configuration component has a data dependency on said registry component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 10, 13, 34, 37, 58, and 61, Wipfel further teaches wherein said liveness component has a data dependency on said registry component and configuration component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 11, 14, 35, 38, 59, and 62, Wipfel further teaches wherein said group services component has a data dependency on said registry component and configuration component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 12, 15, 36, 39, 60, and 63, Wipfel further teaches wherein said resource management component has a data dependency on said registry component and configuration component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claims 16, 40, and 64, Wipfel further teaches wherein said cluster includes a plurality of nodes, and wherein said registry component is included on less than all nodes of said plurality of nodes (see col.9, lines 42-45: "and/or a structure").

As per claims 17, 41, and 65, Wipfel further teaches wherein said configuration component is started by at least one operating system of at least one node of said one or more nodes of said computing environment (see col.6, lines 52-59).

As per claims 18, 42, and 66, Wipfel further teaches wherein said configuration component is responsible for starting one or more components of said registry component, said liveness component, said group services component and said resource management component (see col.9, lines 57-67).

As per claims 19, 43, and 67, Wipfel further teaches wherein the starting of one or more components satisfies at least one of one or more functional dependencies between the one or more components and one or more data dependencies between the one or more components (see Registry 600 and col.14, lines 1-38).

As per claims 20, 44, and 68, Wipfel further teaches wherein said one or more components are started by the configuration component in a defined order (see Registry 600 and col.6, line 67 to col.7, line 6).

As per claims 21, 45, and 69, Wipfel further teaches wherein said defined order comprises starting the registry component, and then the liveness component, the group services component and the resource management component (see Registry 600; col.8, lines 40-52; and col.14, lines 1-38).

As per claims 22, 46, and 70, Wipfel further teaches wherein said registry component begins a first phase of its initialization, in response to being started, said first phase of initialization comprising determining at least one copy of a global configuration database to be used in the starting (see Fig.2, #114; col.9, lines 61-67; col.14, lines 46-49; and col.15, line 61 to col.16, line 5).

As per claims 23, 47, and 71, Wipfel further teaches wherein said configuration component utilizes a copy of said at least one copy of the global configuration database to verify data, and then continue with starting the liveness component, the group services component and the resource management component (see Registry 600; col.8, lines 17-20; and col.14, lines 1-38).

As per claims 24, 48, and 72, Wipfel further teaches wherein said group services component completes its initialization, in response to the liveness component becoming available (see Registry 600; col.8, lines 57-64; and col.14, lines 1-38).

As per claims 25, 49, and 73, Wipfel further teaches wherein said registry component begins a second phase of its initialization, in response to the group services

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component completing initialization, said second phase of initialization comprising updating zero or more copies of the global configuration database to allow write operations against the global configuration database (see Registry 600; col.9, lines 48-52; col.14, lines 1-38 and col.28, line 58).

As per claims 26, 50, and 74, Wipfel further teaches wherein said resource management component performs its initialization using said system registry component and said group services component (see Registry 600; col.9, line 32 to col.11, line 34; and col.14, lines 1-38).

As per claim 75, Wipfel further teaches wherein the configuration data comprises multiple node definitions for the multiple nodes (see Registry 600; col.2, lines 47-52; col.8, line 65 to col.9, line 2; and col.14, lines 3-6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

II. Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wipfel et al. (US 6338112 B1) in view of Thorbjornsen et al. (WO 96/37837).

As per claim 76, Wipfel does not explicitly teach wherein said computing environment is a shared nothing environment. Thorbjornsen teaches of a share nothing computer environment (see abstract, first sentence). It would have been obvious to a

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person of ordinary skill in the art at the time the invention was made to employ the teachings of Thorbjornsen within the system of Wipfel by implementing a share nothing environment within the cluster managing system because Thorbjornsen teaches that within a share nothing architecture, the nodes are divided into groups because this provides multi-fault tolerance and fault masking (see page 6, lines 24-31). Therefore, by incorporating the teachings of Thorbjornsen within the system of Wipfel would provide multi-fault tolerance and fault masking to the cluster managing system.

Response to Argument

9. The examiner summarizes the various points raised by the appellant and addresses replies individually. As per appellants' arguments filed January 24, 2005, the appellant argue in substance:

A. Claims 1-3 and 6-75 rejection of anticipation by Wipfel et al. (US 6338112 B1) is erroneous.

1. Independent claims 1, 27, and 51.
2. Dependent claims 2-3, 6-26, 28-50, and 52-75.

B. Claim 76 rejection of obviousness by Wipfel et al. (US 6338112 B1) in view of Thorbjornsen et al. (WO 96/37837) is erroneous.

In reply to the argument of A.1 above regarding independent claims 1, 27, and 51, the appellant argues that the dependencies of the various components are not taught primary because "Wipfel fails to mention the word dependent (or a derivative thereof)". The appellant further contends "there is no description in Wipfel of a component being dependent on another". Clearly the interdependencies are inherent as explained below with reference to Fig.6 of Wipfel.

Appellant claims that Wipfel does not teach: "liveness component being dependent upon said registry component". However Wipfel teaches in col.14, lines 3-6 that the registry component is maintained during operation of the cluster and tracks when nodes are added, removed, or assigned to different roles and further add in col.14, lines 9-16 that the registry includes a header 602 and two or more node records 604, wherein the header specifies active nodes with normal communication. Therefore, the dependency between the components are inherent that when one node has failed, or its status (Fig.6, #618) reflects an interconnect failure (Fig.3, #326) such information is reflected on the registry component of Wipfel for other nodes to see.

Furthermore with regards to "liveness component being dependent upon... said configuration component", clearly the configuration component of each node record 604 comprises at least the liveness component (Fig.6, #618: status).

With regards to the "group services component being dependent on said registry component, said configuration component and said liveness component" it is inherent that services in order for a component to provide one or more service (see col.14, lines 33-34: special purpose features) it will inherently depend on: a registry component that

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is maintained during operation of the cluster and tracks when nodes are “added, removed, or assigned to different roles”, and changes in the registry component shows the dependency between all components listed in the registry; a configuration component that maintains the configuration of each node record 604; and the liveness component, wherein if the liveness of a particular node is down, clearly the one or more services cannot be provided.

Similarly with regards to the “resource management component being dependent on said registry component, said configuration component and said group service component” it is inherent that in order for communications to be provided to one or more resource controllers of the cluster: the component must know which nodes are within the cluster provided by the registry component; the component must know configuration component of the member nodes, in other words, the capabilities of the particular node to determine whether to communicate with that particular node’s resource controller; and the component must know the capabilities of services for that particular node (group service component). Clearly the “component is reliant or contingent upon the other components” and therefore inherent.

In reply to the argument of A.2 above, specifically regarding claims 21, 45, and 69, clearly the defined order is inherent. The registry component comprises each of the other components and therefore must be started first. Before determining what group services and what resources are to be managed, the status of the node must be determined such as whether the node is operational or not operational. Once the

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node's status is determined, the group services component can begin. The resources cannot be managed before determining the available services, thus the resource management component must begin last.

In reply to the argument regarding claims 22, 46, and 70, it is inherent that when initialization occurs, regardless of the phase, at least a copy of the global configuration database (Fig.2, #114) is employed by the registry component (see col.14, lines 46-49).

In reply to the argument regarding claims 23, 47, and 71, Wipfel clearly teaches that each node to "coordinate their actions" and to "maintain a persistent store of diagnostic information" (see col.14, lines 46-60) utilizes the global configuration database. Furthermore, it is inherent that such information is also utilized for the start of the components.

In reply to the argument regarding claims 24, 48, and 72, again it is inherent in the teachings of Wipfel (see Fig.6 and col.14, lines 1-38) that in order for any service to be known of a particular node, the node's status or the node must be functioning and alive.

In reply the arguments regarding claims 25, 49, and 73, again it is inherent regardless of the phase, which once all the nodes within the cluster have been initialized, a write operations (function of a node's role: see Fig.6, #618) of a particular node is allowed.

In summary, the arguments presented by the appellant are inherent features and characteristics of managing clusters taught by Wipfel.

In reply to the argument of B above, that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Thorbjornsen's teaching that within a share nothing architecture, the nodes are divided into groups because this provides multi-fault tolerance and fault masking (see page 6, lines 24-31), is sufficient motivation to combine. Without the combination of Thorbjornsen, the system of Wipfel would result in corrupt and unreliable shared data. Furthermore, if the Thorbjornsen is not combinable with the teachings of Wipfel, then clearly the dependent claim 76 is rejectable under 112, 2nd for at least the same reasons.

10. For the above reasons, it is believed that the rejections should be sustained.

Michael Won



April 20, 2005



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